

FACT SHEET

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WHAT YOU NEED TO KNOW ABOUT GROWING & EATING FRUITS & VEGETABLES SAFELY

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Vegetable gardening is a great way to grow healthy, nutritious and low-cost produce.

Residential and community gardens can also provide other benefits like increased physical activity, community pride and educational opportunities for young people. Often people ask whether it is safe to grow and eat fruits and vegetables from gardens in their yards or vacant neighborhood lots because of potential chemical contamination. This fact sheet will provide information so you can enjoy growing and eating your fruits and vegetables safely. By taking a few simple precautions, you can reduce your chances of being exposed to contaminants in the soil and still enjoy your homegrown produce.



~ Key Points ~

- ⇒ Vegetable gardening is a great way to grow healthy, nutritious and low-cost food.
- ⇒ Locate your vegetable garden in safe, healthy soil by avoiding areas that may be contaminated.
- ⇒ Using raised beds with clean, rich soils is the best vegetable gardening method.
- ⇒ In some situations, it may be useful to have your soil tested for certain chemicals such as lead or pesticides.
- ⇒ Even if you have eaten vegetables grown in soil that has chemicals, it is very unlikely that your health has been harmed.
- ⇒ Protect yourself and your children by wearing gloves, washing your hands and removing your shoes after gardening activities.
- ⇒ Wash and peel your produce before eating it.

Areas to Avoid Locating Produce Gardens

If you are deciding where to locate a new vegetable garden, there may be areas in your yard to avoid. These include:

- ♦ Areas where there is visible waste like glass, cinders, paint chips, building materials, or visible soil stains
- ♦ Areas next to roadways with busy traffic
- ♦ Areas close to shed, garage or other buildings or fences built before 1978
- ♦ Areas that were previously farmland or orchards
- ♦ Areas where automotive work was done on soil
- ♦ Areas where there may have been a deck or playscape built before 2005

Note: *For groups planning a community garden, we recommend contacting the local health department to obtain information about a specific property.*

Should I plant my garden over my septic system?

No. Gardens should not be planted over your septic system. Septic systems are covered with a minimum of 6 inches of soil. Digging up or into your leaching system can damage the system and could cause health risks. Never plant trees or deeply rooted shrubs over your septic system. Grass is the best vegetation to grow on top of a septic system.

What if I Have Limited Choice About Where to Put My Garden?

It is possible to garden safely in areas where there could be soil contamination. In general, the benefits of gardening are greater than the risks. Testing the soil is an option, but the best method to avoid potential exposures is using raised beds with new clean, richer soil.

Building Raised Beds:

- Start by placing a layer of landscape fabric to prevent plant roots from entering the existing soil.
- Add clean soil and organic matter such as compost and aged manure (not fresh manure).
- To build a permanent raised bed, build a frame to hold the soil. Use untreated lumber (not railroad ties or pressure-treated wood purchased before 2005). Most garden crops need at least 10 inches of soil to thrive so use lumber that will hold at least 10 inches of soil.
- For more information about raised beds, go to <https://extension.umd.edu/resource/building-raised-beds-vegetable-gardening>

When Should I Consider Testing?

In most situations, testing for contaminants is not necessary if you locate your garden in a safe area and/or use raised beds. However, here are instances where testing may be advised:

- Your garden is next to an old building that could have lead paint.
- Your garden is next to a busy roadway.
- There is visible fill material (building materials, cinders, wire, or stained or smelly soil) in existing garden soil.
- Your garden is in a low-lying area known or suspected to have fill placed there in the past.
- Your raised bed garden was built with railroad ties or pressure-treated wood made before 2005.
- Your garden is on land that was a farm or orchard in the past.

Testing, cont.:

There are private labs that will test soils for a fee. These labs can be found by searching for “environmental laboratories.” If you use a lab in Connecticut, make sure they are certified (www.ct.gov/dph/environmentallabs). University cooperative extension services in some states will test garden soil for chemicals for a fee:

- The University of Connecticut Soil Nutrient Analysis Laboratory will test for lead: (www.soiltest.uconn.edu/)
- The University of Massachusetts will test for metals (including lead and arsenic): (<http://soiltest.umass.edu/services>).
- Cornell University will test for metals (including lead and arsenic): (<https://soilhealthlab.cals.cornell.edu/testing-services/>).

Here is a chart to help you decide what soil tests you might need:

Potential Contamination Source	What to Test For
Area within 5 feet of house foundation	Lead if home was built before 1978 Chlordane if home was built before 1988
Busy roads near garden	Lead
Garden next to shed, garage, building or fence	Lead if built before 1978 Arsenic if built before 2005
Past pesticide usage (Old farm or orchard)	Dieldrin, Chlordane, Metals
Pressure-treated wood or railroad ties used to build raised beds	Pesticides Arsenic
Visible fill material or debris	Metals
Oily, stained or smelly soil	Do not garden in soil. Use raised beds only.

I Had My Soil Tested. What do the Results Mean?

You can compare your garden soil test results with CT’s “Direct Exposure” Residential Soil Criteria. These values can be found on page 65 (Appendix A) of the CT Remediation Standard Regulations (<https://eregulations.ct.gov/eRegsPortal/Browse/getDocument?guid=%7b301F1878-0100-CA41-8BBB-0A5DD38DE6FC%7d>)

There are several chemicals for which the Connecticut “Direct Exposure” Residential Soil Criteria are not protective enough for eating homegrown fruits and vegetables. You should compare your garden soil results with the Gardening Soil Target Level in this chart for these specific chemicals.

Even if the levels of chemicals in your soil are low, we still recommend that you follow the safe gardening and safe vegetable preparation tips in this fact sheet. **You can also contact CT DPH for advice based on your results (contact information is on the last page).**

Chemical	Target level (ppm*)
Lead	100
Cadmium	1
Chlordane	0.1
Dieldrin	0.02
DDT	0.2

* What is “ppm”?

Parts Per Million - One part per million is one part of the chemical in one million parts of soil by weight.

$$\text{ppm} = \text{mg/kg} = \mu\text{g/g}$$

My Garden Soil is Contaminated & I Ate Produce. Will I Get Sick?

The soil criteria are set low to ensure you will not have a problem, even if you have eaten the produce for many years. If you have already eaten homegrown produce in soil that is contaminated, the health risks are still very low. You would need to have many years of exposure to high levels of contaminants before health effects would become more likely. Eating the produce for shorter periods (for instance, one season) will not be a substantial risk. It is also possible that the crops you grew did not take up the chemicals.

There are no medical tests for most chemicals that might be in soil. If lead is a concern, blood lead testing is available. Blood testing for children under six is required in Connecticut.

How Can I be Exposed?

To be exposed to chemicals in soil, you need to come into contact with soil that is contaminated and the chemicals need to get into your body. Here are 3 ways:

- **By Mouth** You can be exposed by:
 - ⇒ putting fingers in your mouth that have soil on them, or
 - ⇒ eating food grown in contaminated soil that has not been completely washed or that has taken up chemicals from the soil.
- **Breathing soil dust** It is unlikely that you would be exposed by this route in significant amount.
- **Skin contact** Some chemicals can be absorbed from the soil through the skin.



Selecting Which Crops to Grow



For contaminated (or suspected to be contaminated) soil, the best crops to plant are *fruiting* crops such as tomatoes, peppers, peas, beans and corn. These plants take up (accumulate into parts of the plant) very little, if any, contaminants in the parts we eat. Exceptions are cucumbers and squash. They take up pesticides such as chlordane and dieldrin.

Root crops (such as carrots, beets, and potatoes) can take up some contaminants from the soil. Much of the contamination can be removed by peeling the skin off root vegetables before eating. Even after peeling, a small amount of the chemicals will remain in the flesh of the root vegetable. If you peel these vegetables - and grow and eat less of these type of vegetables - you will have less chance of being exposed to contaminants in the soil.

Leafy greens: Vegetables with large outer leaves (such as cabbage, lettuce, kale, collard greens) easily collect dust and soil backsplash, so careful washing of these plants is advised.

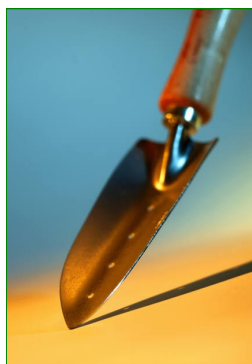


Key Tip:

If there is a concern for chemicals in soil, grow more fruiting crops, less root crops and leafy greens crops.

Preparing Your Garden

Growing fruits and vegetables in raised beds with new topsoil is the best way to prevent exposure to chemicals in the soil. If you cannot use raised beds, adding organic material such as compost or new topsoil to your garden will enrich your soil. This will dilute the amount of contaminants that could be in the soil and will reduce your chances of exposure. Also, plants tend to absorb less toxic metals if the soil is close to neutral pH (6.5-7.0) and has adequate levels of nutrients.



- ⇒ Adding a balanced commercial fertilizer to your garden soil can help maintain correct levels of nutrients.
- ⇒ If your soil is too acidic (low pH), adding lime will bring the pH up to the neutral range.

How do I know if my soil has the correct level of nutrients and pH?

The Connecticut Agricultural Experiment Station will do a fertility test on your garden soil for free. Based on your test results, they will recommend what to add to your soil. For more information, contact the CT Agricultural Experiment Station or other agencies on page 6.

Safe Gardening Practices

- ⇒ Avoid eating and drinking while working in your garden because you could swallow soil and dust that gets on your hands and food.
- ⇒ Wash your hands and work clothes to remove dust and dirt after gardening.
- ⇒ Take off your shoes at the door to avoid tracking a lot of soil into your home.
- ⇒ Wear gloves.
- ⇒ Make sure children do not ingest soil (hand-to-mouth activity).
- ⇒ Do not place moth balls in your garden to keep out pests. It is both dangerous and illegal to use moth balls in this way!



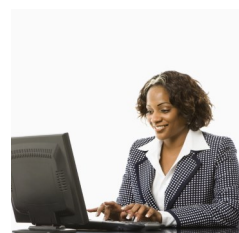
Preparing Fruits and Vegetables

Dust or soil can settle on to the surfaces of the plant. Following these guidelines will prevent or reduce your exposure to any contaminants that could be in the soil.

- ♦ Wash all homegrown produce before eating it. Washing produce is a good idea whether it is homegrown or comes from a market.
- ♦ Soak leafy greens in cool water and rinse thoroughly before cooking. This is especially important for greens that grow low to the ground, such as collard greens, spinach or lettuce.
- ♦ Scrub root vegetables with a clean brush to remove dirt. Peel root vegetables such as carrots, turnips or potatoes before eating. The skin of root vegetables often contains more contaminants than the flesh.
- ♦ Wash the edible portion of fruiting crops such as tomatoes, squash or peppers before eating to remove any soil adhered to the outside skin or peel.



For More Information:



Health Questions	Environmental Questions	Gardening Questions
CT Department of Public Health Toxicology Unit 860-509-7356 DPH.TOX@ct.gov http://www.ct.gov/dph/wastesites	CT Department of Energy & Environmental Protection (DEEP) www.ct.gov/deep	CT Agricultural Experiment Station 123 Huntington Street, New Haven, 203-974-8521 or 153 Cook Hill Road Windsor, CT (860) 683-4977 http://www.ct.gov/caes/soiltesting
Your Local Health Department: www.ct.gov/dph/localhealth	DEEP (Garden Alternatives) www.ct.gov/deep/greengardening	
Agency for Toxic Substances & Disease Registry (ATSDR) 800-232-4636 www.atsdr.cdc.gov	Environmental Protection Agency: http://www.clu-in.org/ecotools/urbangardens.cfm	UConn Soil Nutrient Analysis Lab 860-486-4274 http://www.soiltest.uconn.edu/
<u>Urban Gardening Information</u> https://www.epa.gov/brownfields/steps-creating-community-garden-or-expand-urban-agriculture-brownfields-site		Home & Garden Center UConn Cooperative Extension System (877) 486-6271 http://www.ladybug.uconn.edu/

If you require aid/accommodation to fully and fairly enjoy this publication, please contact 860 - 509 -7356.

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